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Jameco Part Number 198088

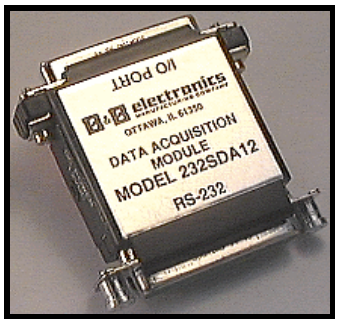
RS-232 Data Acquisition Module
Model 232SDA12

Document No. 232SDA122396

Description

The 232SDA12 provides a low-cost, easy-to-use solution for serial port data acquisition. The 232SDA12 offers 11 channels of 12-bit A/D inputs, 3 digital outputs and 3 digital inputs. With these features, the module can be used to sense a variety of external conditions and to control a variety of devices. The 232SDA12 comes with demo program in QuickBASIC. A data logging utility is included to provide a simple way to import data into other programs and spreadsheets (such as EXCEL). RS-485 and 10-bit A/D versions are available (232SDA10, 485SDA10, and 485SDA12).

Features



- 11 channels of 12-bit A/D
- 0.610mV A/D resolution (with 2.5Vdc Reference)
- 3 digital inputs (-30Vdc to +30Vdc)
- 3 digital outputs (0Vdc to 5Vdc)
- Automatic baud rate detection
- Port power capability

Commands

There are only three commands required to control the 232SDA12: the read A/D command, read digital I/O command and the set output states command. The command string consists of four bytes: the “!” character, the “0” (zero) character, two command characters, and a data byte (if required).

232SDA12 Commands

Function	Command	Response
Read A/D Channels	!0RA{#}	{ch#msb}{ch#lsb}{ch(#-1)msb}... {ch0msb}{ch0lsb}
Read Digital I/O	!0RD	{I/O states}
Set Output States	!0SO{#}	no response

NOTE: Each {...} represents one byte.

In addition to the normal “!” (21h) commands, an extended set of commands using “#” (23h) as the first character have been added to provide bit-error identification by sending complements of character bytes after the fourth byte of the command and in all response character bytes.

232SDA12 Extended Commands

Function	Command	Response
Read A/D Channels	#0RA{#}~{#}	{ch#msb}~{ch#msb}{ch#lsb}~{ch#lsb}{ch(#-1)msb}~{ch(#-1)msb}... {ch0msb}~{ch0msb}{ch0lsb}~{ch0lsb}
Read Digital I/O	#0RD	{I/O states}~{I/O states}
Set Output States	#0SO{#}~{#}	no response

NOTE: Each ~{...} represents complement of one byte.

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A/D Converter

The 232SDA12 has 11 channels of 12-bit A/D inputs. The full-scale voltage can be set anywhere from 2.5Vdc to 5.0Vdc. A 5Vdc reference is available to provide a 0 to 5Vdc range without any external components. The A/D converter has a conversion time around 10 microseconds, however the sampling rate is limited by the serial communications. The actual sampling rate for a single channel is around 120 samples per second (at 9600 baud). This rate drops to 25 samples per second when sampling all of the channels. The A/D inputs are available on a DB-25S (female) connector.

Digital I/O Lines

The 232SDA12 has 3 digital inputs and 3 digital outputs. The 3 digital outputs are CMOS/TTL compatible. The digital inputs are CMOS/TTL compatible and can handle voltages from -30Vdc to +30Vdc. The digital I/O lines are available on a DB-25S (female) connector.

I/O Connector Pinout

DB-25S Pin #	Function	DB-25S Pin #	Function
1	GND	14	Digital Output #0
2	+12Vdc Output*	15	Digital Output #1
3	Digital Input #0	16	Digital Output #2
4	Digital Input #1	17	+5Vdc Output
5	Digital Input #2	18	A/D Ref. Input +
6	Digital GND	19	A/D Ref. Input -
7	Analog GND	20	No connection
8	A/D Input #0	21	A/D Input #6
9	A/D Input #1	22	A/D Input #7
10	A/D Input #2	23	A/D Input #8
11	A/D Input #3	24	A/D Input #9
12	A/D Input #4	25	A/D Input #10
13	A/D Input #5		

*Actual output is equal to power supply input minus 0.7Vdc

Communications

The 232SDA12 connects to your computer's RS-232 serial port through a DB-25S connector. The unit automatically detects baud rates from 1200 to 9600. A data format of 8 data bits, 1 stop bit, and no parity is used. The 232SDA12 is configured as a DCE device.

RS-232 Connector Pinout

DB-25S Pin #	Signal	Direction to 232SDA12	Notes
2	Transmit Data (TD)	Input	Connection is required
3	Receive Data (RD)	Output	Connection is required
4	Request to Send (RTS)	Input	May be used to power unit if kept high
5	Clear to Send (CTS)		Internally looped back to RTS
6	Data Set Ready (DSR)		Internally looped back to DTR
7	Signal Ground (SG)	-	Connection is required
8	Data Carrier Detect (DCD)		Internally looped back to DTR
20	Data Terminal Ready (DTR)	Input	May be used to power unit if kept high

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Specifications

Analog to Digital Converter

Resolution:	12 bit
Channels:	11
Reference Range:	5.0 Vdc max. (1.221 mV per bit) 2.5 Vdc min. (0.610 mV per bit)
A/D Ref. Input -	0 Vdc to 2.5Vdc
A/D Ref. Input +	2.5 Vdc to 5.0 Vdc
Input Voltage Range:	-0.3 Vdc to 5.3 Vdc
Total Unadjusted Error:	+/- 1.0 LSB max.

A/D input channels must be driven from a source impedance less than 1k ohm.

5 Volt Reference

Output Voltage:	4.975 Vdc to 5.025 Vdc (5.0 Vdc typ.)
Accuracy:	+/- 0.5 %
Maximum Output Current:	5 milliamps max.

Digital Inputs

Channels:	3
Voltage Range:	-30 Vdc to 30 Vdc
Low Voltage:	-30 Vdc to 1.0 Vdc
High Voltage:	2.0 Vdc to 30 Vdc
Leakage Current:	1 microamp max.

Digital Outputs

Channels:	3
Low Voltage:	0.6 Vdc @ 8.7 milliamps
High Voltage:	4.3 Vdc @ -5.4 milliamps

Power Supply

Input Voltage:	7Vdc to 18Vdc @ 5 milliamps (Doesn't include the power consumption of external devices.)
Connection:	2.5 mm jack or the through RS-232 DB-25S

NOTE: If RTS and/or DTR are high, the unit may be powered by the RS-232 port.

NOTE: When using an external supply, the supply should be connected only to specifically labeled power inputs (power jack, terminal block, etc.). Connecting an external power supply to the handshake lines may damage the unit. Contact technical support for more information on connecting an external power supply to the handshake lines.

Communications

Standard:	RS-232 (unit is DCE)
Baud Rate:	1200 to 9600 (automatic detection)
Format:	8 data bits, 1 stop bit, no parity
Connector:	DB-25S (female)

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